III

1952-53 CLASS

File No. MIP 1152

C CLASS P.W DEPARTMENT

C CLASS J. BRANCH

C CLASS

C CLASS

Subject:— Ghataprabha Valley Development Project.

MYSORE GOVERNMENT SECRETARIAT
NO... .....
15 JAN 1957
PUBLIC WORKS MAJOR IRRIGATION BRANCH

P.28

File No. MIP 1152 - III

Std. Scott. Mfg Co.

~~38~~, MIR1152/11252

P.W.D.

T.B.

Submitted for information. P.1.32

2. Further developments in the matter may be awaited.

Tho' D.E.(I)

28/4/12

29/11

D.S.(I+E)

3/12

C.E.(I)

3/9.12.12

Secy. NIO

T/L

i/Awt 30/1

10/1

Sh.D

12/12

CRI.1552/12305-3

D.

Sec.

MIP.115.2/1126-11 P.W.D.

J.B.

Resubmitted.

2. The report of Dr. Savage on the dam sites has been received. The papers (file No - GKP. 1552/123063) are at present under submission to D.S.(T+E), Secy. and Minister since 7-1-53. No action is therefore necessary on these papers which may be recorded.

Th. D.E.(I)

19/1/53

23/1/53

23/1 D.S.(T+E).

SEPARATOR

Programme of inspection of the

dam sites of the Ghataprabha Development Scheme by

Dr. J.L.Savage

Leave Bombay by Deccan Queen at 17 hours on 10-11-1952 and reach Ghataprabha at 7.30 hours on 11-11-1952.

11-11-1952 - 8.30 hours - Inspect relief model showing the area covered by the Ghataprabha Valley Development Scheme and the dam sites across the Hiranyakeshi and the Ghataprabha rivers

9.00 " Ghataprabha to Ajra(miles 44) Inspection of the Ajra dam site on the Hiranyakeshi river and of trial pits on the right bank along the dam axis.

Cross over to the left bank of the Hiranyakeshi river, see the trial pits & walk along the dam axis through the first saddle for inspectio of the earth dyke section.

Return to the right bank after recrossing the river inspect the quartzite strata exposed at the Falls near the Ramatirth temple; have tea near the Falls &

16.00 " return to Ghataprabha

17.30 " Inspection of the Ghataprabha Left Bank Canal and Arched flumed Aqueduct(16 arches - 30' span each) across the Jagnur nalla in mile 9 under construction.

12-11-1952 - 8.00 " Ghataprabha - Gadhinglaj;cross the Hiranyakeshi river in truck and go in jeep across the water shed between the Hiranyakeshi and Ghataprabha rivers, cross the Tarva nalla and reach Hadalga dam site left bank.

Inspect the trial pits and walk over to the left bank saddle where a saddle spillway could be located. Inspect trial pit in the saddle. Return to the Ghataprabha river cross it in a bullock cart - inspect the trial pits on the right bank at Hadalga site.

Walk over to the Shettihalli site about half a mile down stream on the same river. Inspect trial pits along the

right.....

right flank of the river on the Shettihalli dam site - go to the saddle on the right bank and inspect trial pits in the saddle - walk down the tail channel of the saddle spillway and back to the Shettihalli dam site. Have lunch at the dam site and walk back to the river and recross it in a bullock cart. Then proceed in a jeep to Tarewadi and inspect cores obtained from exploratory bores on the Hadalga & Shettihalli dam sites on the Ghataprabha river.

Return to Hiranyakeshi river in a jeep and after crossing the river, go to Belgaum & inspect the cores obtained from exploratory bores taken at the Ajra site on the Hiranyakeshi river. After inspection proceed to Dharwar.

13-11-1952 - 7.00 hours — Leave Dharwar for inspection of dam site on the Dharma River at Yamgalli. Inspect trial pits on the dam axis and discuss type of spillway for the earthen dam. Return to Hubli - lunch and entrain for Bombay.

Public Works Department, Bombay State

Karnatak Irrigation Circle, Dharwar.

QUESTIONNAIRE REGARDING AJRA DAM SITE.

It is proposed to construct a storage dam on the Hiranyakeshi River - a tributary of the Ghataprabha River near Ajra town for irrigation purposes. The salient features of the dam, as proposed, are as under:-

(i)	Dam site.	At Ajra on the Hiranyakeshi River.
(ii)	Catchment area	90 square miles
(iii)	Rainfall	Varying from 275" to 100" at the dam site.
(iv)	Proposed storage	(a) Gross:34,200 M.cft.
		(b) Effective:32,500 M.cft.
(v)	Purpose of storage	Mainly for irrigation
(vi)	Length of Dam	7,800 ft.
	River bed	R.L.2120.00
	Top of dam	R.L.2278.00
	Dead Water level	R.L.2174.00
	F.S.L.	R.L.2270.00
(vii)	Height of Dam above river bed	158 feet.
(viii)	Maximum flood intensity as per Inglis formula	65,000 cusecs
(ix)	Type of Dam	Composite dam with central masonry overflow spillway.
(x)	Surplussing arrangement	Overflow section on the dam.

The dam site is situated in a quartzite gorge. Exploratory bores and open trial pits show that the local strata consists of alternating layers of massive bedded quartzite rock and thin flaggy layers of softer sand stone with an occasional layer of shaly character. As a whole the strata shows a stratified structure practically horizonta

and.....

and very slightly dipping with open joints and fissure at higher levels to a depth of 20 feet or so from the ground level.

The percolation tests conducted in some bore holes with a locally made apparatus show that generally, the leakage is heavy up to a depth of 20 ft. and and even at greater depths in some cases.

QUESTION NO. 1

Foundations:

(a) In the light of the above features, is the solid gravity type masonry dam for the central portion of overflow spillway with earthen flanks, the most suitable proposition? What depths are recommended for stripping, blasting, wedging, or line drilling? What steps or slopes are recommended at changes of depths for founding the dam at changes of depths in the longitudinal section of the dam seat.

(b) Will not the storage be adversely affected by excessive leakage through foundation and flanks and the fissured tank basin upstream due to the jointed and fissured nature of the local strata? Where the spur is narrow on the left flank, will there be leakage into another valley?

(c) If the leakage losses are expected to be heavy, will a foundation treatment consisting of -

(i) founding the masonry section of the dam on quartzite bed after stripping off the surface strata to a depth of about 20 ft.

(ii) consolidation grouting below the dam base for a depth of about 20 ft. and a curtain grout for half the full supply depth below river bed

(1)....

(1) effectively reduce percolation losses and (2) be also adequate to bear the load of the dam? What pattern of grout holes and depths are recommended?

In view of the recurrent occurrence of the thin flaggy intercalations of soft sandstone and shales, what would be the best treatment for increasing the bearing strength? Will they take grout in view of the water pressure test results. If not, can air and water pressure wash them out? What equipment is recommended for washing and grouting ?

(d) If an earthen dam is proposed, what would be the nature of river diversion works in view of the stratified and intermittently occurring soft thin intercalation in both flanks? Where should the spillway be located?

QUESTION NO. 2

Uplift:

(a) It is proposed to design the masonry sectio of the dam by allowing full uplift pressure at the upstream heel gradually decreasing to 50% at drainage gallery and equal to tail water pressure at toe acting over the full area of base. Will this do or is any modification necessary? Will there be time lag in building up the uplift pressure? If so, which should be taken for calculating uplift - Full supply level or high flood level over the spillway? Similarly should High flood tail water or normal tail water should be taken for calculating uplift?

(b) What arrangement of drainage holes and gallery is recommended and what should be sequence of drilling and grouting holes and drilling drainage holes?

(c).....

(c) What type of instruments are recommended to be installed for measuring uplift, leakage, temperature, stresses and deflections in the body of the dam?

QUESTION NO. 3

Spillway:

(a) Having regard to the jointed and fissured nature of the quartzite rock in the river bed, is it advisable to have an overflow spillway section of the dam in the river gorge portion? If so, is it necessary to provide cement concrete lining over the face of masonry? in this section and what should be its thickness? What arrangement is recommended for dissipation of energy and protection against scour down stream of the spillway? What length of spillway and what depth of flood over the spillway crest are recommended in this case for passing a flood of 65,000 cusecs in view of the proposal of providing flood gates in the spillway section? Should the protective apron or bucket be at the same level for the full length of spillway section or can it be built at different levels to suit the gorge portion with divide walls at change of levels? Should it be at river bed level?

(b) Would you advise surplussing sluices in addition ~~in addition~~ to overflow spillway for establishing density currents for minimising siltation? If so, how many, of what sizes, of what type and at what level would you recommend them? As we are proposing to impound full average yield from the catchment(realisable in 75 out of 100 years), will it not be risky to pass floods through sluices as the tank may not fill later on?

(c).....

(c) What type of spillway gates would you recommend over the crest?

(d) Would a side or saddle spillway be suitable in this case? If so, where should it be located? What protection would it need?

QUESTION NO. 4

Scouring sluices

Of what type, how many, of what size and at what level should the scouring sluices be provided? Should they be in addition to the surplussing sluices mentioned in Question 3? Should they be at lower level than the surplussing sluices?

QUESTION NO. 5

Canal sluices

For purposes of the canal, water will be let down from the storage into the river to be picked up by a diversion weir about 45 miles lower dam from where the canal takes off. The canal capacity at present contemplated is 2000 cusecs. But it may be increased to 3000 cusecs. Dead water level at the Dam is at R.L.2174.00 allowing 1628 M.cft. for silIation.

Of what type, how many, of what size and at what level should the canal sluices be provided?

QUESTION NO. 6

Hydel sluices

Hydro-electricity is proposed to be generated at the dam as water is being issued for irrigation. At what level should such sluices be located? Should the passage in the dam be lined with steel plates?

Question 7....

QUESTION NO. 7

Investigations

Are any more important investigations considered necessary to arrive at a sound design for the dam?

QUESTION NO. 8

Dams in similar strata

Are any dams constructed in the U.S.A. or elsewhere in similar geological co ndition & if so, what is the actual experience regarding the behaviour of the dam regarding bearing strength, percolation losses and in other respects?

Public Works Department, Bombay State
Karnatak Irrigation Circle, Dharwar.

QUESTIONNAIRE REGARDING HADALGA DAM SITE

It is proposed to construct a storage dam on the Ghataprabha River at Hadalga for irrigation purposes. The salient features of the dam, as proposed, are as under:-

i)	Dam site	At Hadalga on the Ghataprabha River.
ii)	Catchment area	134 square miles
iii)	Rainfall	Varying from 250" to 50" at the dam site.
iv)	Proposed storage	(a) Gross: 34,200 M.cft.
		(b) Effective: 32,500 M.cft.
v)	Purpose of storage	Mainly for irrigation
vi)	Length of Dam	1540 ft.
	River bed	R.L.2253.00
	Top of dam	R.L.2371.00
	Dead water level	R.L.2288.00
	Dead storage capacity	1700 M.cft.
	F.S.L.	R.L.2363.00
vii)	Height of Dam above river bed	118 feet
viii)	Maximum flood intensity as per Inglis formula	79,700 cusecs
ix)	Type of Dam	Solid gravity masonry dam
x)	Surplussing arrangement	Overflow section on the dam.

The dam site is situated in a quartzite gorge Exploratory bores and open trial pits show that the local strata consists of alternating layers of massive bedded quartzite rock and thin flaggy layers of softer sand stone with an occasional layer of shaly character. As a whole the strata shows a stratified structure practically horizontal and very slightly dipping, with open joints & fissured at higher levels to a depth of

20 feet.

20 feet or so from the ground level.

The percolation tests conducted in some bore holes with a locally made apparatus show that generally, the leakage is heavy up to a depth of 20 feet and even at greater depths in some cases.

The site was inspected by Dr.Savage on 12-11-1952.

QUESTION NO. 1

Foundations:

(a) In the light of the above features, is the solid gravity type masonry dam with central overflow section, the most suitable proposition? What depths are recommended for stripping, blasting, wedging, or line drilling? What steps or slopes are recommended for founding the dam at changes of depths in the longitudinal section of the dam seat.

(b) Will not the storage be adversely affected by excessive leakage through foundation and flanks and the fissured tank basin upstream due to the jointed and fissured nature of the local strata? Will there be leakage through the narrow spur on the right bank?

(c) If the leakage losses are expected to be heavy, will a foundation treatment consisting of -

(i) Stripping the surface strata to a depth of about 20 feet,

(ii) consolidation grouting below the dam base for a depth of about 20 ft below the stripping and a curtain grout for half the full supply depth below river bed,

(a) effectively reduce percolation losses and (b) be also adequate to bear the load of the dam? What pattern of grout holes and depths are recommended?

In view of the recurrent occurrence of the thin flaggy intercalations of soft sandstone and hales, what would be the best treatment for

increasing the bearing strength? Will they tak grout in view of the water pressure test results? If not, can air and water pressure wash them out? What equipment is recommended for washing and grouting?

(d) If an earthen dam is proposed, what would be the nat-ure of river diversion works in view of the stratified and intermittently occurring soft thin intercalation in both flanks? Where should the spillway be located?

QUESTION NO. 2

Uplift:

(a) It is proposed to design the masonry section of the dam by allowing full uplift pressure at the upstream heel decreasing to 50% at drainage gallery and equal to tail water pressure at toe acting over the full area of base. Will this do or is any modification necessary? Will there be time lag in building up the uplift pressureM? If so, which should be taken for calculating uplift - Full supply level or high flood level - over the spillway? Similarly should High flood tail water or normal tail water be taken for calculating uplift?

(b) What arrangement of drainage holes and gallery is recommended and what should be sequence of drilling and grouting holes and drilling drainage holes?

(c) What type of instruments are recommended to be installed for measuring uplift, leakage, temperature, stresses and deflections in the body of the dam?

QUESTION NO. 3

Spillway:

(a) Having regard to the jointed and fissured nature of the quartzite rock in the river bed, is it advisable to have an overflow spillway section of the dam in the river gorge portion? If so, is it necessary to provide cement concrete lining over the face of masonry in this section and what should be its thickness? What arrangement is recommended for dissipation of energy and protection against scour down stream of the spillway? What length of spillway and what depth of flood over the spillway crest are recommended in this case for passing a flood of 79,700 cusecs in view of the proposal of providing flood gates in the spillway section? Should the protective apron or bucket be at the same level for the full length of spillway section or can it be built at difference levels to suit the gorge profile with divide walls at change of levels? Should it be at river bed level?

(b) Would you advise surplussing sluices in addition to overflow spillway for establishing density currents for minimising siltation? If so, how many, of what sizes, of what type and at what level would you recommend them? As we are proposing to impound full average yield from the catchment (realisable in 75 out of 100 years), will it not be risky to pass floods through sluices as the tank may not fill later on?

(c)....

(c) What type of spillway gates would you recommend?

(d) Would a side or saddle spillway be suitable in this case? If so, where should it be located in the saddle at right or left? What protection would it need in each case?

QUESTION NO.4

Scouring sluices

Of what type, how many, of what size and at what level should the scouring sluices be provided? Should they be in addition to the surplussing sluices mentioned in Question 3? Should they be at lower level than the surplussing sluices?

QUESTION NO. 5

Canal sluices

For purposes of the canal, water will be let down from the storage into the river to be picked up by a diversion weir about 40 miles lower down from where the canal takes off. The canal capacity at present contemplated is 2000 cusecs. But it may be increased to 3000 cusecs. Dead water level at the Dam is at R.L.2288.00 allowing about 1700 M.cft. for siltation.

Of what type, how many, of what size and at what level should the canal sluices be provided?

At the full development of the Ghataprabha Valley, a Right Bank Canal is proposed to be built and taken directly from this dam. If the Ghataprabha dam is built first, it will have to feed the Left Bank canal now under construction and when the Right Bank canal is built, the supply of water from this storage to the Left Bank Canal will have to be cut off and switched on to the Right Bank Canal. A second storage will have to be built on the Hiranyakeshi at Ajra then

to feed the Left Bank Canal. At full development the canal sluices will have to feed the Right Bank Canal directly and the canal sluices will have, therefore, to be kept at the Right Bank Canal bed level although for the present water meant for the Left Bank Canal will have to be let down in the river to be picked up by the diversion weir at the head of the Left Bank Canal.

QUESTION NO.6

Hydel sluices

Hydro-electricity is proposed to be generated at the dam as water is being issued for irrigation. At what level should such sluices be located? Should the passage in the dam be lined with steel plates?

QUESTION NO.7

Investigations

Are any more important investigations considered necessary to arrive at a sound design for the dam?

QUESTION NO.8

Dams in similar strata

Are any dams constructed in the U.S.A. or elsewhere in similar geological condition and if so, what is the actual experience regarding the behaviour of the dam regarding bearing strength, percolation losses and in other respects?

PUBLIC WORKS DEPARTMENT, BOMBAY STATE

KARNATAK IRRIGATION CIRCLE, DHARWAR

Questionnaire regarding the Shettihälli Dam Site

It is proposed to construct a storage dam on the Ghataprabha River eighher at Shettihalli or Hadalga, which are situated within a distance of 6 furlongs from each other. This questionnaire pertains to Shettihalli Dam, the salient features of which, are given below.-

i)	Dam site	At Shettihalli, on the Ghataprabha River
ii)	Catchment area	170 sq. miles.
iii)	Rainfall	Varying from 250" to 50" at the dam site.
iv)	Proposed storage	(a) Gross 37500 M.cft.
		(b) Effective 35500 Mcft.
v)	Purpose of storage	Mainly for irrigation (some power generation at the dam site is envisaged).
vi)	Length of dam	1680 feet
	River bed	R.L.2247.00
	Top of dam	R.L.2369.00
	Dead water level	R.L.2283
	Dead water storage	2000 M.cft.
	F.S.L.	R.L. 2361
vii)	Height of dam above river bed	122 feet
viii)	Maximum flood intensity as per Ingli's Formula	90200 cusecs
ix)	Type of dam	Solid gravity type, masonry dam or alternatively a rolled fill earth dam.
x)	Surplussing arrangement	Overflow section in the dam or an open cut saddle spillway.

These sites were visited by Dr.Savage on 12-11-1952.

The.....

The dam site is situated in a narrow quartzite gorge. Exploratory bores and open trial pits show that the local strata consists of soft sand stone and shales in thin layers with an occational layer of compact quartzite bed. On the whole, the strata shows a stratified structure practically horizontal or very slightly dipping, with joints and fissures at higher levels. Percolation tests conducted in some of the bore holes, with a locally made apparatus show that generally leakage is heavy upto a depth of about 40 feet from ground level and even at greater depths in some cases.

QUESTION No. 1

Dam

(a) In the light of the local features described above, will the site be suitable for a solid gravity type masonry dam? If yes, what depths are recommended for stripping, blasting, wedging or line drilling? Are steps or slopes recommended at changes of depths in the flank portions?

(b) Will not this storage be adversely affected by excessive leakage through foundation and flanks due to the jointed and fissured nature of the local strata?

(c) If the leakage losses are expected to be heavy will a foundation treatment consisting of (i) stripping off the surface strata to a depth of about 30 feet, (ii) consolidation grouting below the dam base for a depth of about 20 feet and (iii) curtain grouting for an additional depth of about 30 feet in the front, effectively reduce percolation lossess and be also strong enough to bear the load of the dam? What pattern of grout holes and depths are recommended?

(d) There is a narrow spur on the right flank. Will it need any treatment against leakage?

Question.....

QUESTION NO.2

Uplift

(i) It is proposed to design the masonry section of the dam by allowing full uplift pressure at heel decreasing to 50% at the drainage gallery and to tail water pressure at toe, acting over full area of base. Will this do or any modification is necessary?

(ii) What arrangement of drainage holes and gallery is recommended and what should be the sequence of drilling and grouting holes and drilling drainage holes?

(iii) What type of instruments are recommended to be installed for measuring, uplift, leakage, temperature, stresses and deflection in the body of the dam?

QUESTION NO.3

Spillway

(i) Having regard to the jointed and fissured nature of the quartzite rock in the river bed, is it advisable to have an overflow dam? If so, what down-stream protection is recommended? Will the arrangement of bucket and baffle with necessary apron or apron with standing wave afford adequate protection against damage to foundation by scour? In case the spillway is located separately in the right hand saddle, what arrangement will be needed to dissipate energy of water issuing from irrigation and surplussing sluices in the dam?

(ii) Would an open cut saddle spillway on the right flank be a better proposition than a central overflow spillway dam although costlier? If so, what protection would be needed for its tail channel?

(iii).....

(iii) What type of flood regulating arrangements would suit most if the spillway is located in the dam itself or alternatively in a saddle?

(iv) Would you advise surplussing sluices in addition to overflow to minimise siltation?

QUESTION NO.4

Sluices

(i) At what tentative levels the canal sluices, hydel sluices, scouring sluices, and surplussing sluices may be located? What type is recommended in each case?

(ii) Are any scouring sluices considered necessary? If so, the type of such sluices and the depths at which they should be located may be recommended?

QUESTION NO.5

Is this site, which ensures an additional yield of about 3000 M.cft., preferable to Hadalga site(6 furlong above), where foundation conditions appear more favourable?

QUESTION NO.6

Earthen dam

(i) In case it is proposed to adopt an earthen dam, what type of cut off and foundation treatment would be recommended taking into consideration the peculiarities of the local strata?

(ii) What diversion arrangement would be most suitable in view of the local topography, a construction programme of about 5 years, and the maximum flood intensity of 90200 cusecs?

QUESTION NO.7

Are any more important investigations considered necessary to arrive at a sound design for the dam?

QUESTION NO.8

Are any dams constructed in the U.S.A. or elsewhere in similar geological conditions and if so, what is the actual experience regarding the behaviour of the dams and the percolation losses?

PUBLIC WORKS DEPARTMENT, BOMBAY STATE

Karnatak Irrigation Circle, Dharwar

QUESTIONNAIRE REGARDING THE YEMAGALLI DAM SITE

It is proposed to construct an earthen dam across the Dharama River near Yemagalli Village for Irrigation purposes. The salient features of the dam, as proposed, are as under:-

1)	Dam site	At Yemagalli on the Dharma River
2)	Catchment area	37.75 sq. miles
3)	Rain Fall	Average 60 inches per annum
4)	a. Type of Dam	Earthen Dam with C.C.cut off in the Gorge portion and puddle cut off in the flanks.
	b. Length of dam	4750 ft.
	c. Height of dam above River bed	66 ft.
	d. Proposed capacity	784 M.cft.
	e. River bed level	R.L. 1879.00
	f. Full supply x level	R.L. 1931.00
	g. High flood level	R.L. 1937.00
	h. Top of dam	R.L. 1945.00
5)	Purpose of Storage	Irrigation
6)	Maximum Flood intensity as per Inglis formula	41,000 cusecs
7)	Surplussing arrangements	R.C.C.Chute spillway on the right flank, with a C.C. lined tail channel

The strata at the dam site consists of (i) a surface layer of somewhat pervious red murumy soil having a thickness of 2 to 6 feet (ii) an intermediate layer of fairly impervious but poor and friable yellowish clayey soil derived from the underlying micaceous schist and varying in depth from 2 to 30 ft.

&.....

& (iii) a bedding stratum of highly disintegrated micaceous schist rock.

QUESTION NO. 1

Dam

What should be the nature of cut off? Whether a C.C. cut off would be necessary for the whole length of the dam or a puddle cut off would do or a combination of both would be desirable?

(b) Sufficient pervious material for dam-casing is not available locally and hence it is proposed to construct the hearting with selected impervious soils and the casing with the available local soil. Is a filter on the down stream of the hearting necessary for will only an arrangement of longitudinal and cross base-drains will do?

QUESTION NO. 2.

Spillway

A fall of nearly 50 ft. has got to be negotiated within a length of about 2000 feet from the dam to the river, for disposing of the flood waters. Will a chute spillway with a C.C. lined tail channel, as proposed now, work satisfactorily or any other type of surplussing arrangement such as undersluices or masonry overflow spillway would be more desirable? What protection would be recommended in the latter cases in view of the deep overburden of poor soils? What types of foundations are advised if sluices and/or overflow masonry section are to be adopted?

	A	J	R	A	D	A	
	Masonry dam with saddle spillway	Full earthen dam with saddle spillway		Composite dam with saddle spillway		Composit dam with central masonry overflow spillway	
1. Catchment area square miles	90	90		90		90	
2. Safe Maximum run-off	32500	32500		32500		32500	
3. Storeage Designed							
a)Net storage M.cft	33167	33167		33167		33167	
b)Dead storage M.cft	1628	1628		1628		1628	
c)Gross storage M.cft.	34795	34795		34795		34795	
4. Important levels							
a) River bed - R.L.	2120	2120		2120		2120	
b) Outlet sill - R.L.	2174	2174		2174		2174	
c) F.S.L. R.L.	2270	2270		2270		2270	
d) H.F.L. R.L.	2270	2270		2270		2270	
e) Top masonry section R.L.	2278			2278		2278	
f) Top of earthen section R.L.		2282		2282		2282	
5. Length of Dam (approximately)feet	7800	8100		7900		7900	
6. Submergence							
a) Land submergence acres(at F.S.L.	16300	16300		16300		16300	
b)House submergence Nos(approximately)	1560	1560		1560		1560	
c)No.of villages affected	33	33		33		33	
d)No. of population affected	8000	8000		8000		8000	
7. Cost details							
a) Total cost of storage scheme in Rs. lacs	633	496		516		489	
b) Cost per M.cft. of available storage in Rs.	1913	1500		1555		1475	
8. R E M A R K S							

LOPMENT SCHEME STORAGE PROJECT

NADALGA DAM			SHETTIHALLI DAM		
Full masonry dam with saddle spillway	Masonry dam with central overflow spillway.	Earthen dam with saddle spillway	Full masonry dam with saddle spillway	Masonry dam with xx central overflow spillway	Earthen dam with saddle spillway
134	134	134	170	170	170
32500	32500	32500	35500	35500	35500
32573	32573	32573	36275	36275	36275
1625	1625	1625	1853	1853	1853
34198	34198	34198	38128	38128	38128
2253	2253	2253.00	2247.00	2247.00	2247.00
2288	2288	2288.00	2283.00	2283.00	2283.00
2363	2363	2363.00	2361.00	2361.00	2361.00
2375	2363	2363.00	2361.00	2361.00	2361.00
2381	2371	.00	2369.00	2369.00	
		2375.00			2373.00
1543	1543	1620	1680	1680	1750
20100	20100	20100	22700	22700	22700
3100	3100	3100	4000	4000	4000
37	37	37	46	46	46
13000	13000	13000	17000	17000	17000
438	415	452	546	463	558
1345	1275	1391	1538	1304	1571

Superintending Engineer, K.I.C.

GHATAPRABHA VALLEY DEVELOPMENT SCHE

As part of the Ghataprabha Valley Development Scheme, it itself and the second on the Hiranyakeshi River - a tributary of with and the second one subsequently. This statement gives the co alternative storage sites investigated so far for facilitating s

Item	Storage site at Ajra (Hiranyakeshi River)	A R
(1) Type of dam & its approximate cost	(a) Full masonry dam with saddle spillway Rs. 633 lacs	(
	(b) Full earthen dam with saddle spillway " 496 "	(
	(c) Composite dam(with central masonry over-flow section and earthen flank) " 489 "	(
(2) Effective storage capacity	32,500 M.cft.	
(3) Land submergence	16,300 acres	
(4) No.of villages affected by submergence	33 Nos.	
(5) Population affected by submergence	8000 persons	
(6) New Road diversions required dur to sub-mergence of existing Roads	about 15 miles	
(7) Conveniences already available near the dam site	The Taluka Town of Ajra is situated within a mile and a half of the dam site, and hence marketing schooling & medical facilities are available at the site. The length of access road to the dam site & construction colony will not exceed about 5 miles.	Al re in m ti at
(8) Additional advantages	(a) It is possible to generate hydel power at the dam site. Load centres for the hydel power are available within a distance of 30 miles (b) After this dam is constructed, it will be possible to make use of part of the river-course for navigation purposes and also it will be possible to develop lift irrigation on either bank of the river where there is fertile soil with the electric power generated at the dam site.	In of th al ei f pi Va ou Ru wh wi th co a

STORAGE SITES FOR THE...

s proposed to provide the storage Reservoirs, one on the Ghataprabha River
e Ghataprabha. It is proposed to construct only one storage dam to start
rative advantages and disadvantages of each of the three promising
ction of the most promising site for the first dam.

ternative storage sites on the Ghataprabha River

Hadalga site	Shettihalli site	Remarks
)Full masonry dam with saddle spillway Rs.. 438 lacs	(a) Full masonry saddle spillway Rs. 546 lacs	The only advantage of the Shettihalli site is that it offers an additional storage of 3000 M.cft the additional cost being about 50 lacs. The Hadalga site on the other hand offers definitely better foundation conditions and a cheaper storage dam.
)Full masonry dam with central overflow section " 415 "	(b) Full masonry dam with central overflow section " 462 "	
Full earthen dam with saddle spill-- way " 452 "	(c) Earthen dam with saddle spillway " 558 "	
32,500 M.cft.	35,500 m.cft.	A comparison between the AJRA & HADALGA sites shows that the former offers decidedly better foundation conditions, lesser land submergence and simpler problems concerning the re-settlement of the ousted population. Moreover a dam at the Ajra site would form a self contained unit with the Ghataprabha Left Bank Canal already under construction.
20,100 acres	22,700 acres	
27 Nos.	46 Nos.	
13,100 persons	17,000 persons	
about 18 miles	about 18 miles	
t 20 miles of new access d will be required, and addition special schooling dical & marketing facili- s will have to be provided the construction site	Same as for Hadalga site	
addition to the possibility enerating hydel power, at dam site itself, it is e possible to take advantage the natural fall about 200 t between the Ghata- bha Valley & the Hiranyakeshi ley for getting additional put of hydro-electricity. this will not be possible n the whole of the storage l be required for use on Right Bank Canal. Load res are available within stance of 30 miles from dam site.	Same as for Hadalga except that the hydel power slightly cheaper.	

(b)

D.O.No. Gb.1.B.

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar(Bombay State)India,
Dated 21/ November 1952.

Dear Dr Savage,

Subject:- Inspection of dam sites in the Bombay State between 11-11-1952 and 13-11-1952

Pertinent data, geological reports, detailed core charts, results of water pressure tests in the exploratory bore holes, etc., of the three dam sites ((i) at Ajra on the Hiranyakeshi river inspected on 11-11-1952, (ii) at Hadalga and (iii) Shettihalli on the Ghataprabha river inspected on 12-11-1952) were submitted to you on 13-11-1952. I forward herewith questionnaire in respect of A (1) Ajra dam site on the Hiranyakeshi river

(2) Hadalga dam site on the Ghataprabha river

(3) Shettihalli dam site on the Ghataprabha

all pertaining to the Ghataprabha Valley Development Scheme;

and B Dam site for a reservoir on the Dharma River at Yamgalli

as desired by you, with a request to advise us on the various points ~~kmxp~~ mentioned therein.

As regards A (1),(2) and (3) above, only one dam is to be constructed in the first instance. I enclose a statement showing advantages and disadvantages of each of the three sites. Please inform us which, in your opinion, may be taken up first.

Yours sincerely,

Encl.
as above.

(A.G.Naik)

To

Dr. J.L.Savage,
Consulting Engineer
C/o Dr.K.L.Rao,M.Sc.,Ph.D.,A.M.I.C.E.,
M.I Struct.E.,M.I.E.,
Director, Designs,
Central Designs Office,
Central Water & Power Commission,
Bikanir House, Shahajehan Road,
NEW DELHI.

Copy.....

P.1-30

Copy with copies of enclosures forwarded with compliments to the Chief Engineer to Government, Public Works Department, Bombay, for information, with reference to Government Letter No.G.K.P 1552-J, dated 7-11-1952.

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